



11-25-03

2863

Application number: 09/893,952
Application filed: 2001 June 28
Applicant: Charles Vann
Title: Orientation and Position Sensor
Examiner: Hien X. Vo
Date: November 22, 2003

TECHNOLOGY CENTER 2800

DEC - 8 2003

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Assistant Commissioner for Patents
Alexandria, VA 22313

Sir:

In response to Office communication mailed November 10, 2003, please amend the above application as follows: Cancel claims 8-13. Add new claims 14-19 as follows.

14. [new] A position and orientation sensor, comprising:

an alignment target having a first optical feature a fixed distance from

a second optical feature;

an imaging device that can form an optical image of said alignment

target with said first feature in-focus at a distinct location and

size in said image and said second feature out-of-focus at a

distinct location and size in said image;

whereby said location and size of said first feature in said optical image and said location and size of said second feature in said optical image are measurements of up to three orthogonal positions and up to three orthogonal orientations of said alignment target with respect to said imaging device.

15. [new] The sensor of claim 14 wherein one or more of said

features is a cross hair.

16. [new] The sensor of claim 14 wherein said imaging device comprises a lens and a transparent projection screen.
17. [new] The sensor of claim 14 wherein said imaging device is a camera.
18. [new] The sensor of claim 14 further including a monitor connected to said imaging device.
19. [new] The sensor of claim 14 further including a computer connected to said imaging device.

COUNTER TO REJECTION UNDER 35 U.S.C., paragraph 112

Claim 8 was rejected by Examiner because the limitation "the location and size" in line 6 has insufficient antecedent basis as required under 35 U.S.C., paragraph 112. Claim 14 above replaces claim 8 to clearly provide an antecedent basis for the words "location and size" in lines 8 and 9.

COUNTER TO REJECTION OF CLAIM 8 (now 14) UNDER 35 U.S.C., para. 102(b)

Claim 8 (now 14) was rejected by Examiner under 35 U.S.C. paragraph 102(b) for being anticipated by Carter (U.S. Patent No. 6,034,764). Applicant appreciates the Examiner taking the time to thoroughly examine and underline cited statements of the Carter reference. However, applicant provides the following explanation as to why this invention was not anticipated by Carter.

This invention has physical features not included in Carter, in particular the alignment target. This alignment target, consisting of a first and second optical feature, is a physical feature of the invention. In contrast, the targets discussed by Carter, a bridge and highway, are not features of the invention, but rather, they are objects the invention is designed to measure the distance between.

Furthermore, the first and second optical features of the alignment target in claim 8 (now 14) are made a fixed distance apart. In contrast, the targets described by Carter are not a fixed distance apart, and the purpose of the invention is to determine the distance between those targets.

Also, Carter determines the distance between the bridge and highway by measuring the difference between their locations in the eyepiece image. In contrast, this invention measures the location and size of the first and second features relative to references in the image and not the distance between the two features.

The Examiner identifies col. 1, lines 40-47 as anticipating an alignment target. However, this is a description of a first and second optical axis of the instrument not an alignment target.

The Examiner identifies a reference to an imaging device as items 25,26 in figure 4,5. Col. 2, lines 37-46 describe items 25,26 as electronic distance finding device not an imaging device.

The Examiner stated that col. 5., lines 17-67 and col. 6, lines 1-60 describe how Carter measures up to three positions and orientations. However, these references describe only a one-dimension measurement – the distance between the bridge and highway. In contrast, this invention describes in detail how to measure all three positions and all three orientations of the alignment target relative to the camera.

COUNTER TO REJECTION OF CLAIMS 9-13 (now 15-19) UNDER 35

U.S.C., para. 102(b)

The Examiner identifies a reference to a cross-hair in col. 3, line 28. This cross-hair 36 is a feature in Carter's eyepiece. In contrast, the cross-hair in the applicant's invention is an optical feature of the alignment target.

The Examiner states that Figures 2-5 identify a lens and transparent projection screen. These figures show eyepiece optics 32 but not a projection screen. Eyepiece 32 is transparent and requires viewing on the optical axis. In contrast, a projection screen is translucent or diffuse such that an image of the alignment target could be viewed off the optical axis.

The Examiner states that items 25,26 in Figure 4 are cameras. However, col. 2, lines 37-46 describes items 25,26 as an electronic distance finding device not a camera.

The Examiner identifies a reference to a monitor and computer in col. 3, lines 10-25. However, this reference describes a tilt sensor rather than a monitor or computer.

Conditional request for constructive assistance

If for any reason this application is not believed to be in full condition for allowance, applicant respectfully requests the constructive assistance and suggestions of the examiner pursuant to M.P.E.P. & 2173.02 and 707.07(j) in order that the undersigned can place this application in allowable condition as soon as possible and without the need for further proceedings.

Sincerely,



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